

IN THE CLAIMS:

1. (Currently Amended) A method of processing timing information from an electronic device, comprising the steps of:

generating a first set of responses from the device in response to a first stimulus, each of said first set of responses representing one or more events of a first series of events;

generating a second set of responses from the device at a second frequency in response to a second stimulus, each of said second set of responses representing one or more events of a second series of events, said second series of events occurring simultaneously with said first series of events;

receiving the first and second sets of responses from the device; and

processing the received first and second sets of responses to distinguish said first series of events from said second series of events, and to identify responses that are in synchronization with the first stimulus and to identify responses that are in synchronization with the second stimulus.

2. (Original) A method according to Claim 1, wherein the processing step includes the step of using a single analyzer to measure simultaneously the first and second sets of responses from the electronic device.

3. (Currently Amended) A method ~~according to Claim 1,~~ of processing timing information from an electronic device, comprising the steps of:

generating a first set of responses from the device in response to a first stimulus;

generating a second set of responses from the device at a second frequency in response to a second stimulus;

receiving the first and second sets of responses from the device; and

processing the received responses to identify responses that are in synchronization with the first stimulus and to identify responses that are in synchronization with the second stimulus; and

wherein the processing step includes the steps of:

measuring the received responses to obtain a full data set; and

subtracting from the full data set, a data set representing the first set of responses to obtain a data set representing the second set of responses.

4. (Currently Amended) A method ~~according to Claim 1~~, of processing timing information from an electronic device, comprising the steps of:

generating a first set of responses from the device in response to a first stimulus;

generating a second set of responses from the device at a second frequency in response to a second stimulus;

receiving the first and second sets of responses from the device; and

processing the received responses to identify responses that are in synchronization with the first stimulus and to identify responses that are in synchronization with the second stimulus; and

wherein:

the first stimulus is a clock signal external of the electronic device;

the second stimulus is a clock signal internal of the electronic device; and

the processing step includes the step of processing the received responses to synchronize the internal clock signal with the external clock signal.

5. (Currently Amended) A method ~~according to Claim 1,~~ of processing timing information from an electronic device, comprising the steps of:

generating a first set of responses from the device in response to a first stimulus;

generating a second set of responses from the device at a second frequency in response to a second stimulus;

receiving the first and second sets of responses from the device; and

processing the received responses to identify responses that are in synchronization with the first stimulus and to identify responses that are in synchronization with the second stimulus; and

wherein:

the electronic device is an integrated circuit including a multitude of individual switching circuits;

the first stimulus causes a first group of the switching circuits to switch states in synchronization with the first stimulus;

said first group of switches emit photons when the first group of switches switch states, and/or in varying degrees depending on their state;

the second stimulus causes a second group of the switching circuits to switch states in synchronization with the second stimulus; and

said second group of switches emit photons when the second group of switches switch states, and/or in varying degrees depending on their state.

6. (Original) A method according to Claim 5, wherein:

the receiving step includes the step of receiving the photons emitted from the first and second groups of switches; and

the processing step includes the steps of

- i) converting the received photons to an electric signal, and
- ii) analyzing said electrical signal to identify a first component of said electrical signal representing the photons emitted from the first group of switches and to identify a second component of said electrical signal representing the photons emitted from the second group of switches.

7. (Original) A method according to Claim 6, wherein the step of analyzing the electrical signal includes the step of subtracting said first component from the electrical signal to obtain said second component.

8. (Currently Amended) A method of processing timing information with respect to a stimulus applied to an electronic device, comprising the steps of:

locating the electronic device in a given environment including at least a first environmental factor causing the electronic device to generate a first set of responses, each of said first set of responses representing one or more events of a first series of events;

applying the stimulus to the device to generate a second set of responses, each of said second sets of responses one or more events of a second series of events, said second series of events occurring simultaneously with said first series of events;

receiving the first and second sets of responses from the device; and

processing the received first and second sets of responses to distinguish said first series of events from said second series of events, and to separate the responses due to said environmental factor from the responses due to the stimulus and to identify the responses due to the stimulus.

9. (Original) A method according to Claim 8, wherein:

the electronic device is an integrated circuit including a multitude of individual switching circuits;

said environmental factor causes at least some of said switching circuit to emit photons; and

the timing signal causes at least some of said switching circuits to emit photons.

10. (Currently Amended) A method ~~according to Claim 9, of processing timing information with respect to a stimulus applied to an electronic device, comprising the steps of:~~

locating the electronic device in a given environment including at least a first environmental factor causing the electronic device to generate a first set of responses;

applying a stimulus to the device to generate a second set of responses;

receiving the first and second sets of responses from the device; and

processing the received responses to separate the responses due to said environmental factor from the responses due to the stimulus and to identify the responses due to the stimulus; and

wherein:

the receiving step includes the step of receiving photons emitted from the switching circuits; and

the processing step includes the steps of

- i) converting the received photons to an electric signal, and
- ii) analyzing said electric signal to identify a first component of the electric signal representing photons emitted from the switching circuits due to the environmental factor, and to identify a second component of the electric signal representing photons emitted from the switching circuits due to the stimulus.

11. (Original) A method according to Claim 10, wherein said environmental factor is room lighting.

12. (Currently Amended) A system for processing timing information from an electronic device, comprising:

means for applying a first stimulus to the device, wherein in response to the first stimulus, the device generates a first set of responses, each of said first set of responses representing one or more events of a first series of events;

means for applying a second stimulus to the device, wherein in response to the second stimulus, the device generates a second set of responses, each of said second set of responses representing one or more events of a second series of events, said second series of events occurring simultaneously with said first series of events;

a detector for receiving the first and second sets of responses from the device; and

a processor for processing the received first and second sets of responses to distinguish said first series of events from said second series of events, and to identify responses that are in synchronization with the first stimulus and to identify responses that are in synchronization with the second stimulus.

13. (Original) A system according to Claim 12, wherein the processor is a single analyzer to measure simultaneously the first and second sets of responses from the electronic device.

14. (Currently Amended) A system ~~according to Claim 12,~~ for processing timing information from an electronic device, comprising:

means for applying a first stimulus to the device, wherein in response to the first stimulus, the device generates a first set of responses;

means for applying a second stimulus to the device, wherein in response to the second stimulus, the device generates a second set of responses;

a detector for receiving the first and second sets of responses from the device; and

a processor for processing the received responses to identify responses that are in synchronization with the first stimulus and to identify responses that are in synchronization with the second stimulus; and

wherein the processor includes:

means for measuring the received responses to obtain a full data set; and

means for subtracting from the full data set, a data set representing the first set of responses to obtain a data set representing the second set of responses.

15. A system according to Claim 12, for processing timing information from an electronic device, comprising:

means for applying a first stimulus to the device, wherein in response to the first stimulus, the device generates a first set of responses;

means for applying a second stimulus to the device, wherein in response to the second stimulus, the device generates a second set of responses;

a detector for receiving the first and second sets of responses from the device; and
a processor for processing the received responses to identify responses that are in synchronization with the first stimulus and to identify responses that are in synchronization with the second stimulus; and

wherein:

the means for applying the first stimulus is a clock external of the electronic device;

the means for applying the second stimulus is a clock internal of the electronic device; and

the processing step includes the step of processing the received responses to synchronize the internal clock signal with the external clock signal.

16. (Currently Amended) A system ~~according to Claim 12,~~ for processing timing information from an electronic device, comprising:

means for applying a first stimulus to the device, wherein in response to the first stimulus, the device generates a first set of responses;

means for applying a second stimulus to the device, wherein in response to the second stimulus, the device generates a second set of responses;

a detector for receiving the first and second sets of responses from the device; and
a processor for processing the received responses to identify responses that are in synchronization with the first stimulus and to identify responses that are in synchronization with the second stimulus; and,

wherein:

the electronic device is an integrated circuit including a multitude of individual switching circuits;

the first stimulus causes a first group of the switching circuits to switch states in synchronization with the first stimulus;

said first group of switches emit photons when the first group of switches switch states, and/or in varying degrees depending on their state;

the second stimulus causes a second group of the switching circuits to switch states in synchronization with the second stimulus; and

said second group of switches emit photons when the second group of switches switch states, and /or in varying degrees depending on their state.

17. (Original) A system according to Claim 16, wherein:

the detector includes means for receiving the photons emitted from the first and second groups of switches and for converting the received photons to an electric signal; and

the processor includes means for analyzing said electric signal to identify a first component of said electric signal representing the photons emitted from the first group of switches and to identify a second component of said electric signal representing the photons emitted from the second group of switches.

18. (Original) A system according to Claim 17, wherein the means for analyzing the electric signal includes means for subtracting said first component from the electric signal to obtain said second component.

19. (Currently Amended) A system ~~according to Claim 12,~~ for processing timing information from an electronic device, comprising:

means for applying a first stimulus to the device, wherein in response to the first stimulus, the device generates a first set of responses;

means for applying a second stimulus to the device, wherein in response to the second stimulus, the device generates a second set of responses;

a detector for receiving the first and second sets of responses from the device; and
a processor for processing the received responses to identify responses that are in
synchronization with the first stimulus and to identify responses that are in
synchronization with the second stimulus; and

wherein:

the device generates the first set of responses at a first frequency;

the device generates the second set of responses at a second frequency;

the first and second frequencies may or may not be the same;

the first stimulus is related to the application of a specific first set of circuit
stimuli (e.g., a first test pattern), resulting in a first time varying pattern of photon
emissions from some or all circuits on the chip;

the second stimulus is related to the application of a specific second set of circuit
stimuli (e.g., a second test pattern), resulting in a second time varying pattern of photon
emissions from some or all circuits on the chip; and

the application of said first and second sets of circuit stimuli optionally being
interwoven in any desired fashion.

20. (New) A method according to Claim 1, wherein the processing step includes the
steps of:

measuring the first and second sets of responses; and

averaging said measurements over a period of time to distinguish said first and
second series of events.